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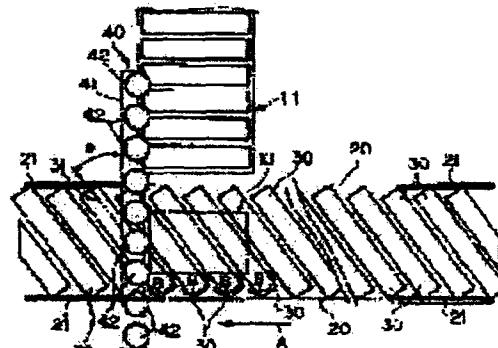
(22)Date of filing : 06.04.1995 (72)Inventor : YOKOYA SHIGEHARU

(54) CONVEYANCE DIRECTION CONVERSION DEVICE

(57)Abstract:

PURPOSE: To convert the conveyance direction of an article and change the orientation of the article to the conveyance direction before and after the conveyance direction conversion.

CONSTITUTION: A fixed stopper 40 prevents the travel of an article 10 put on an endless chain 20 in a conveyance direction A by engaging with a stopper roller 42 and causes predetermined friction force between the article 10 and a conveyance roller 30. Consequently, the advance course of the article 10 is converted substantially to a right angle when viewed on plane, the article moves upward and is put on a branch chute 11 while rotating the conveyance roller 30 in an arrow B direction so that a top face of the conveyance roller 30 moves in the reverse direction to the travel direction of the endless chain 20 in accordance with the travel of the endless chain 20.



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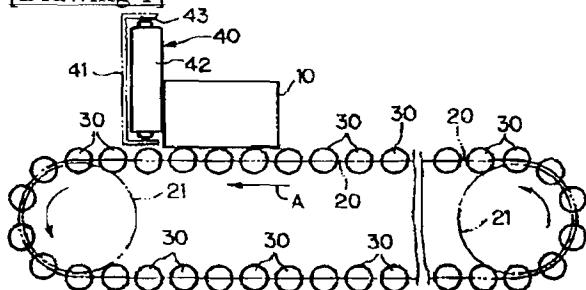
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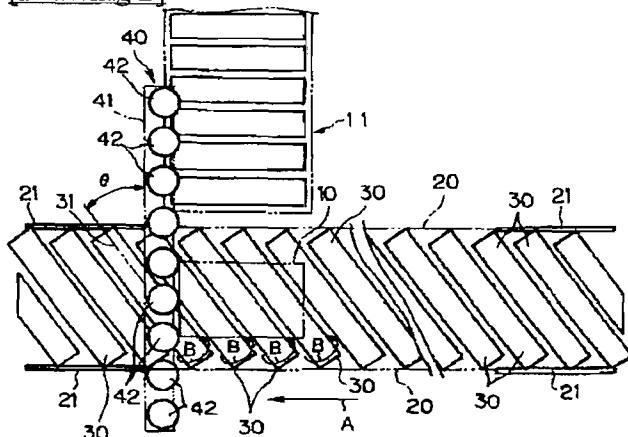
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DRAWINGS

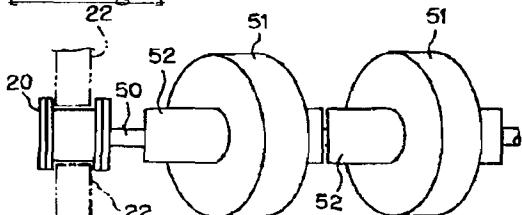
[Drawing 1]



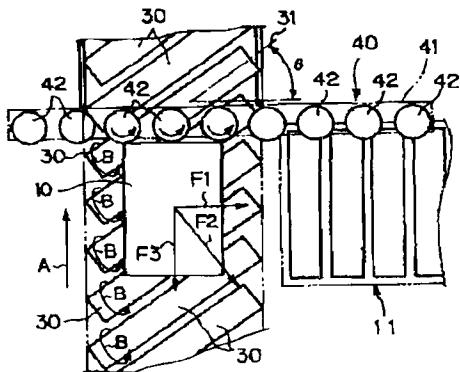
[Drawing 2]



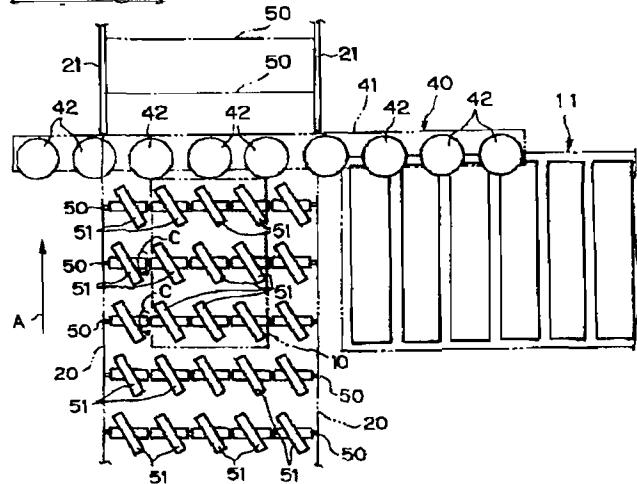
[Drawing 6]



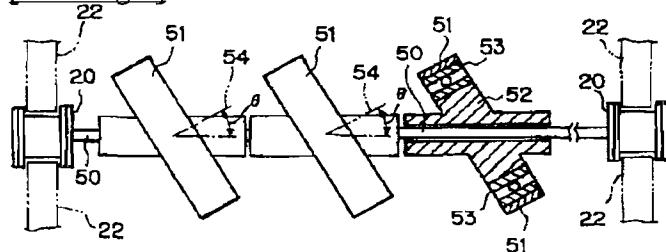
[Drawing 3]



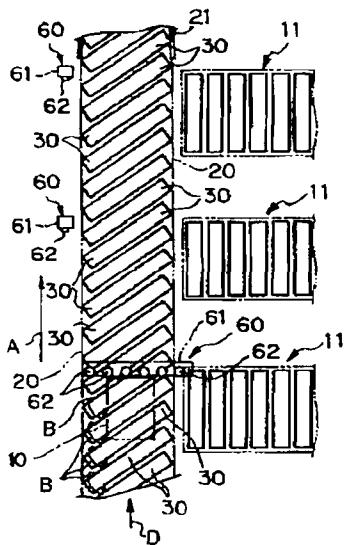
[Drawing 4]



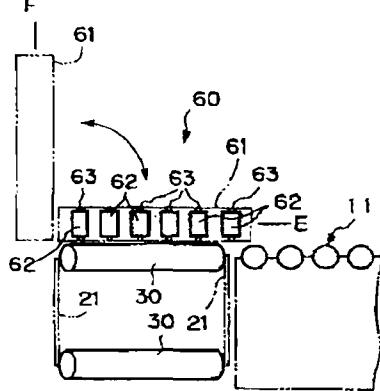
[Drawing 5]



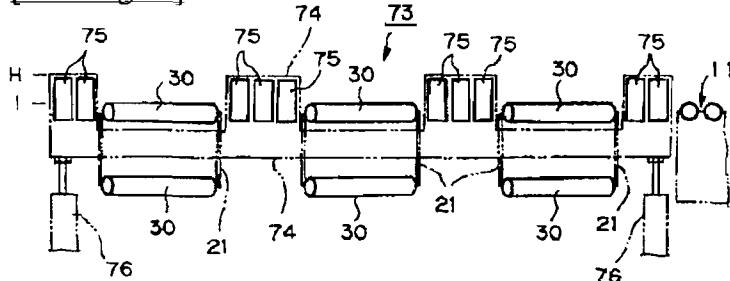
[Drawing 7]



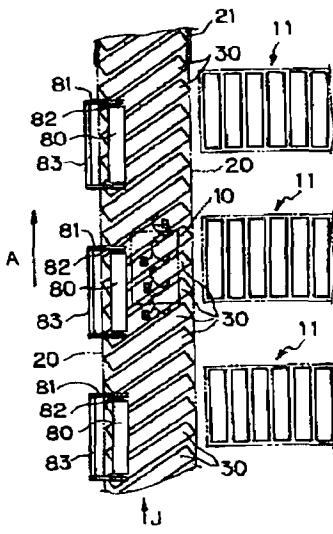
[Drawing 8]



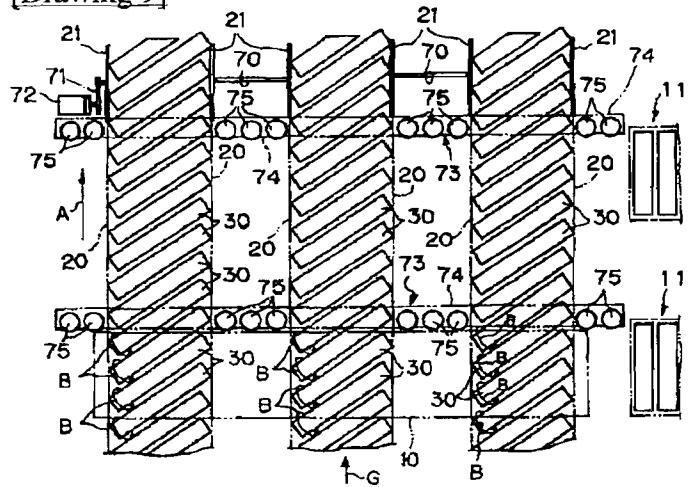
[Drawing 10]



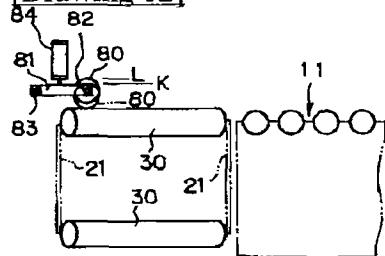
[Drawing 11]



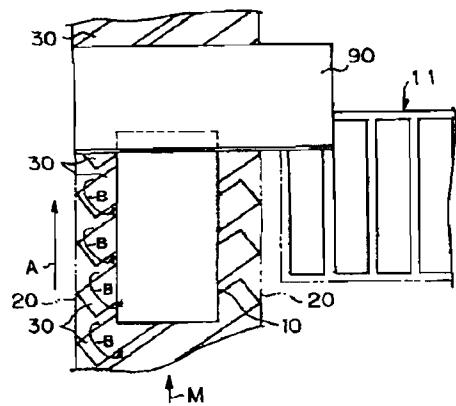
[Drawing 9]



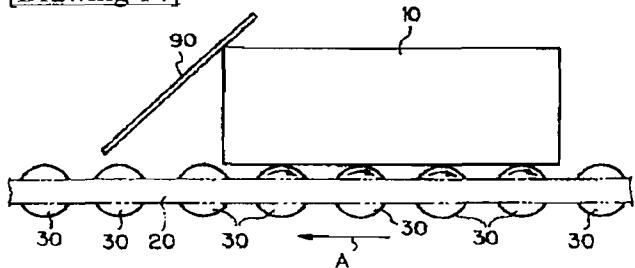
[Drawing 12]



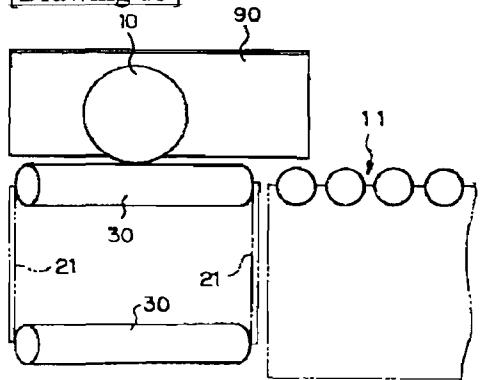
[Drawing 13]



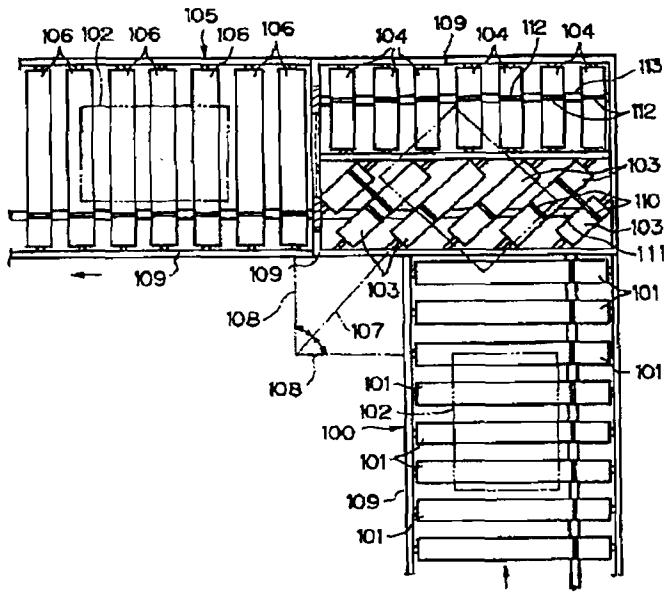
[Drawing 14]



[Drawing 15]



[Drawing 16]



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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the outline side elevation showing the conveyance direction convertor which is the 1st example of this invention.

[Drawing 2] It is the top view of drawing 1.

[Drawing 3] It is the top view which expanded a part of drawing 2.

[Drawing 4] It is the outline top view showing the conveyance direction convertor which is the 2nd example of this invention.

[Drawing 5] It is the top view which expanded a part of drawing 4.

[Drawing 6] It is the perspective view of drawing 5.

[Drawing 7] It is the outline top view showing the conveyance direction convertor which is the 3rd example of this invention.

[Drawing 8] It is D view Fig. of drawing 7.

[Drawing 9] It is the outline top view showing the conveyance direction convertor which is the 4th example of this invention.

[Drawing 10] It is G view Fig. of drawing 9.

[Drawing 11] It is the outline top view showing the conveyance direction convertor which is the 5th example of this invention.

[Drawing 12] It is J view Fig. of drawing 11.

[Drawing 13] It is the outline top view showing some conveyance direction convertors which are the 6th example of this invention.

[Drawing 14] It is the left side view of drawing 13.

[Drawing 15] It is M view Fig. of drawing 13.

[Drawing 16] It is the top view showing the conventional conveyance direction convertor.

[Description of Notations]

10 Goods

11 Branching Chute

20 Endless Chain

30 Body of Revolution (Conveyance Roller)

31 Revolving Shaft

40 Stopper (Fixed Stopper)

50 Support Shaft

51 Body of Revolution (Conveyance Wheel)

54 Revolving Shaft

60 Stopper (Rocking Stopper)

73 Stopper (Rise-and-Fall Stopper)

80 Friction Member (Friction Roller)

90 Friction Member (Stopper Plate)

A The conveyance direction

E The location engaged in goods (rocking location)

F The location which is not engaged in goods (evacuation location)

H The location engaged in goods (rise location)

I Location which is not engaged in goods (downward location)

theta Predetermined include angle (include angle which a revolving shaft makes to the conveyance direction and the direction which intersects perpendicularly)

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OPERATION

[Function] In the conveyance direction convertor of the above-mentioned **, the goods laid in body of revolution are conveyed in the predetermined direction with migration of an endless chain. And if goods engage with a stopper and have migration in the migration direction of an endless chain prevented, they will produce predetermined frictional force between body of revolution. Thereby, goods move along with a stopper, rotating body of revolution with migration of an endless chain, so that the top face of body of revolution may move to the migration direction and hard flow (it is the same the slanting back and the following) of an endless chain. The migration direction and passing speed of goods at this time are decided mainly according to the include angle which the passing speed of an endless chain and the revolving shaft of body of revolution make to the migration direction of an endless chain, and the direction which intersects perpendicularly.

[0011] In the conveyance direction convertor of the above-mentioned **, a conveyance roller is conveyed in the predetermined direction with the laid goods to migration of an endless chain. And by engaging with a friction member from the upper part, a conveyance roller rotates so that a top face may move to the migration direction and hard flow of an endless chain. Thereby, the passing speed of an endless chain and the revolving shaft of a conveyance roller mainly move goods in the predetermined direction at the rate of predetermined according to the include angle made to the migration direction of an endless chain, and the direction which intersects perpendicularly.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the conveyance direction convertor into which the conveyance direction of goods is converted while conveying goods with migration of an endless chain.

[0002]

[Description of the Prior Art] Conventionally, as equipment into which the conveyance direction of goods is converted, as shown in drawing 16, there are some which guide the goods 102 on the conveyance roller 101 of main Rhine 100 with the induction roller 103 and the rectilinear-propagation roller 104 on the conveyance roller 106 of turn Rhine 105 which intersects perpendicularly with main Rhine 100 mostly (refer to JP,2-8900,Y). an include angle with the virtual production 107 of a revolving shaft respectively almost equal [the induction roller 103] to the virtual production 108 of the revolving shaft of the conveyance roller 101,106 of each Rhine -- with, it is supported by the frame 109 free [rotation] so that it may cross. Through the endless belt 110, the induction roller 103 is interlocked with a driving shaft 111, and is rotated. The rectilinear-propagation roller 104 is in a condition almost parallel to the conveyance roller 106 of turn Rhine 105, and is supported by the frame 109 free [rotation]. The rectilinear-propagation roller 104 is interlocked with a driving shaft 113 through the endless belt 112, and rotates rather than the induction roller 103 at high speed.

[0003] In such equipment, the goods 102 which have had the conveyance roller 101 top of main Rhine 100 conveyed are further revolved in the direction of a plane view counter clockwise with the rectilinear-propagation roller 104 which is carried on the rectilinear-propagation roller 104 and rotates a travelling direction forward right edge rather than the induction roller 103 at high speed, revolving in the direction of a plane view counter clockwise with the induction roller 103. And goods 102 are in the condition revolved in about 90 degrees of the directions of a plane view counter clockwise, and are sent on the conveyance roller 106 of turn Rhine 105.

[0004] Moreover, there are some which are extruded on the conveyance roller 106 of turn Rhine 105 from on the conveyance roller 101 of main Rhine 100 by preparing the arm member (not shown) which can press goods 102 in the location which counters with turn Rhine 105 across main Rhine 100, and pressing goods 102 by the arm member.

[0005]

[Problem(s) to be Solved by the Invention] With the former equipment shown in drawing 16 among the conventional equipment mentioned above, since it revolves about 90 degrees of plane view in case it is guided to turn Rhine 105 from main Rhine 100, the sense of goods 102 of the goods 102 to the conveyance direction corresponds on main Rhine 100 and turn Rhine 105 (i.e., before and after converting the conveyance direction). Therefore, the goods 102 which are conveyed in the condition that a longitudinal direction meets in the conveyance direction in the layout, with which main Rhine 100 as shown in drawing 16, and turn Rhine 105 intersect a right angle mostly will be in the condition that a longitudinal direction meets in the conveyance direction, even after having the conveyance direction converted. For this reason, goods 102 have the problem that the space efficiency after a conveyance turn

is very low, as compared with the case where will stand in a row in a longitudinal direction on turn Rhine 105, and it stands in a row in the direction of a short hand.

[0006] Moreover, according to the latter equipment, goods 102 are not revolved in case it is transferred to turn Rhine 105 from main Rhine 100. For this reason, the goods 102 which are conveyed in the condition that a longitudinal direction meets in the conveyance direction in the layout, with which main Rhine 100 and turn Rhine 105 intersect a right angle mostly change the sense to the conveyance direction, after being extruded by the arm member on turn Rhine 105, and the direction of a short hand will be in the condition of meeting in the conveyance direction. Therefore, goods 102 can secure high space efficiency as compared with the case where will stand in a row in the direction of a short hand on turn Rhine 105, and it stands in a row in a longitudinal direction. However, in order that it is necessary to prepare the arm member which can be pressed from main Rhine 100 to turn Rhine 105 and structure may complicate goods 102 by one side, there is a problem of causing increase of components mark and a man-hour for assembly. Moreover, in order to have to operate an arm member according to the timing by which goods 102 are conveyed, based on detection of the goods 102 by a sensor etc., it is necessary to perform complicated and advanced device control. Therefore, there is a problem that cost increase is not avoided.

[0007] The purpose of this invention is comparatively simple structure, being able to convert the conveyance direction of goods without needing complicated control etc., can change the sense of the goods to the conveyance direction before and after a conveyance turn, and is to offer the conveyance direction convertor which can secure high space efficiency by this.

[0008]

[Means for Solving the Problem] The above-mentioned purpose of this invention is attained by the following configuration.

** The endless chain which opens predetermined spacing, is prepared one pair and moves in accordance with a predetermined path, respectively (20), So that a revolving shaft (31 54) may make a predetermined include angle (theta) in plane view between endless chains (20) to the migration direction of an endless chain (20), and the direction which intersects perpendicularly It is prepared free [rotation]. The body of revolution of a large number which can lay goods (10) (30 51), It is prepared along the migration direction of an endless chain (20), and the crossing direction, and engages with the goods (10) laid in body of revolution (30 51). The conveyance direction convertor characterized by having the stopper (40, 60, 73) which prevents migration of goods (10) in the migration direction of an endless chain (20).

[0009] ** The endless chain which opens predetermined spacing, is prepared one pair and moves in accordance with a predetermined path, respectively (20), So that a revolving shaft (31) may make a predetermined include angle (theta) in plane view between endless chains (20) to the migration direction of an endless chain (20), and the direction which intersects perpendicularly free [rotation] And by opening predetermined spacing in the migration direction of an endless chain (20), preparing more than one, and engaging with the conveyance roller (30) which can lay goods (10), and a conveyance roller (30) from the upper part The conveyance direction convertor characterized by having the friction member (80 90) which rotates a conveyance roller (30) with migration of an endless chain (20) so that the top face of a conveyance roller (30) may move to the migration direction and hard flow of an endless chain (20).

[0010]

[Function] In the conveyance direction convertor of the above-mentioned **, the goods laid in body of revolution are conveyed in the predetermined direction with migration of an endless chain. And if goods engage with a stopper and have migration in the migration direction of an endless chain prevented, they will produce predetermined frictional force between body of revolution. Thereby, goods move along with a stopper, rotating body of revolution with migration of an endless chain, so that the top face of body of revolution may move to the migration direction and hard flow (it is the same the slanting back and the following) of an endless chain. The migration direction and passing speed of goods at this time are decided mainly according to the include angle which the passing speed of an endless chain and the

revolving shaft of body of revolution make to the migration direction of an endless chain, and the direction which intersects perpendicularly.

[0011] In the conveyance direction convertor of the above-mentioned **, a conveyance roller is conveyed in the predetermined direction with the laid goods to migration of an endless chain. And by engaging with a friction member from the upper part, a conveyance roller rotates so that a top face may move to the migration direction and hard flow of an endless chain. Thereby, the passing speed of an endless chain and the revolving shaft of a conveyance roller mainly move goods in the predetermined direction at the rate of predetermined according to the include angle made to the migration direction of an endless chain, and the direction which intersects perpendicularly.

[0012]

[Example] Below, an illustration example explains this invention. Drawing 1 - drawing 3 are drawings showing the conveyance direction convertor which is the 1st example of this invention, and drawing 1 is the top view where an outline side elevation and drawing 2 expanded the top view of drawing 1, and drawing 3 expanded a part of drawing 2. In these drawings, by the fixed stopper 40, they have migration prevented, and it is converted into a plane view **** right angle, and the goods 10 laid in the conveyance roller 30 move a course to the method of drawing 2 Nakagami, and are transferred on the predetermined branching chute 11 while they are conveyed in the predetermined conveyance direction (the direction of arrow-head A) with migration of the endless chain 20.

[0013] The endless chain 20 opens predetermined spacing in the conveyance direction A and the direction which intersects perpendicularly, and is prepared in it one pair in parallel. The endless chain 20 is wound over between the sprockets 21 of a pair, and rotates in the direction of the counter clockwise in drawing 1 in connection with one of the sprockets 21 driving by a motor etc. (not shown), respectively. Thereby, the endless chain 20 is moved in accordance with a predetermined path (in this example, it is an ellipse-like path at side view), showing around at the chain guide 22 (refer to drawing 5) prepared in the conveyor frame (not shown).

[0014] Between the endless chains 20, free [rotation], the conveyance roller 30 opens predetermined spacing in the conveyance direction A, and are formed so that a revolving shaft 31 may make the predetermined include angle theta (this example about 45 degrees) in plane view to the migration direction (namely, the conveyance direction A) of the endless chain 20, and the direction which intersects perpendicularly. [two or more] Being able to lay goods 10 in the top face of the conveyance roller 30, the conveyance roller 30 conveys the laid goods 10 by moving in the conveyance direction A with migration of the endless chain 20, respectively.

[0015] In the fixed stopper 40, the stopper frame 41 is arranged along the conveyance direction A and the direction which intersects perpendicularly near the left end section in drawing 1 above the conveyance roller 30. The stopper roller 42 of plurality (this example nine pieces) is supported by the stopper frame 41 free [rotation] centering on the almost perpendicular revolving shaft 43 at the stopper frame 41. The fixed stopper 40 prevents migration of goods 10 in the conveyance direction A by making the stopper roller 42 engage with the front face of the conveyance direction of the goods 10 on the conveyance roller 30.

[0016] An operation of this example is explained. The goods 10 laid in the conveyance roller 30 are conveyed in the conveyance direction A with migration of the endless chain 20. And if goods 10 engage with the stopper roller 42 of the fixed stopper 40 and have migration in the conveyance direction A prevented, they will produce predetermined frictional force between the conveyance rollers 30. Thereby, rotating the conveyance roller 30 in the direction of drawing 3 Nakaya mark B with migration of the endless chain 20, so that the top face of the conveyance roller 30 may move to the migration direction and hard flow (it is only described as hard flow and slanting back is hereafter meant, although it is the slanting back correctly) of the endless chain 20, it is converted into a plane view **** right angle, and goods 10 move a course to the method of drawing 3 Nakamigi. That is, the goods 10 which had the course converted rotating the stopper roller 42 in the direction of the counter clockwise in drawing 3, they move to the method of drawing 3 Nakamigi along with the stopper frame 41, and are transferred on the predetermined branching chute 11.

[0017] The migration direction and passing speed of goods 10 at this time are decided mainly according to the include angle theta which the passing speed V of the endless chain 20 (a part for m/) and the revolving shaft 31 of the conveyance roller 30 make to the conveyance direction A and the direction which intersects perpendicularly. That is, when drawing 3 is referred to, the force F1 in which it moves goods 10 to the method of drawing 3 Nakamigi is one component of the force F2 which acts on goods 10 by rotation to the direction of drawing 3 Nakaya mark B of the conveyance roller 30. The component of another side of the force F2 is the force F3 of the conveyance direction reverse sense of acting on the goods 10 which had migration prevented by the fixed stopper 40. Therefore, when passing speed of the endless chain 20 is set to V, the rotational speed (peripheral speed) to the direction of drawing 3 Nakaya mark B of the conveyance roller 30 is expressed with $V/\cos\theta$, and the passing speed to the method of drawing 3 Nakamigi of goods 10 is expressed with $\sin(V/\cos\theta)\theta = V \cdot \tan\theta$. Moreover, the relative velocity of goods 10 and the endless chain 20 is equal to the passing speed V of the endless chain 20. For example, when it is $\theta = 45$ degrees, the passing speed to the method of drawing 3 Nakamigi of goods 10 is $V \cdot \tan 45^\circ = V$, and goods 10 move to the method of drawing 3 Nakamigi with passing speed V.

[0018] In addition, the force F1 in which it moves goods 10 to the method of drawing 3 Nakamigi inclines toward a part for the conveyance direction point in the base of goods 10 etc. partially, does not act on it, and acts on the whole base of goods 10 almost equally. For this reason, goods 10 have the conveyance direction converted in the condition of having been stabilized, without disturbing a posture.

[0019] Drawing 4 - drawing 6 It is drawing showing the conveyance direction convertor which is the 2nd example of this invention, and the top view and drawing 6 to which drawing 4 expanded the outline top view, and drawing 5 expanded a part of drawing 4 are the perspective view of drawing 5. In this example, it replaces with the conveyance roller 30 of the 1st example, and the support shaft 50 and the conveyance wheel 51 are formed. Other configurations are the same as that of the 1st example.

[0020] Between the endless chains 20, the support shaft 50 opens predetermined spacing in the conveyance direction A, and are prepared so that the conveyance direction A and shaft orientations may cross at right angles. [two or more] The conveyance wheel 51 consists of urethane etc. and is supported free [rotation] through bearing 53 by the plastics base 52 supported by each support shaft 50. The virtual center line 54 used as the revolving shaft of the conveyance wheel 51 makes the predetermined include angle theta (this example about 45 degrees) in the shaft orientations and plane view of the support shaft 50. Being able to lay goods 10 in the top face of the conveyance wheel 51, the conveyance wheel 51 conveys the laid goods 10 by moving in the conveyance direction A with migration of the endless chain 20, respectively.

[0021] An operation of this example is explained. The goods 10 laid in the conveyance wheel 51 are conveyed in the conveyance direction A with migration of the endless chain 20. And if goods 10 engage with the stopper roller 42 of the fixed stopper 40 and have migration in the conveyance direction A prevented, they will produce predetermined frictional force between the conveyance wheels 51.

Thereby, rotating the conveyance wheel 51 in the direction of drawing 4 Nakaya mark C with migration of the endless chain 20, so that the top face of the conveyance wheel 51 may move to the conveyance direction A and hard flow, it is converted into a plane view *** right angle, and goods 10 move a course to the method of drawing 4 Nakamigi. That is, the goods 10 which had the course converted rotating the stopper roller 42 in the direction of the counter clockwise in drawing 4, they move to the method of drawing 4 Nakamigi along with the stopper frame 41, and are transferred on the predetermined branching chute 11.

[0022] Drawing 7 and drawing 8 are drawings showing the conveyance direction convertor which is the 3rd example of this invention, drawing 7 is an outline top view and drawing 8 is D view Fig. of drawing 7. In these drawings, predetermined spacing is opened in the conveyance direction A in a conveyor frame, respectively, two or more (this example three pieces) arrangement is carried out, the branching chute 11 is replaced with the fixed stopper 40 in the branch location to each branching chute 11, respectively, and the rocking stopper 60 is formed corresponding to each branching chute 11. Other configurations are the same as that of the 1st example.

[0023] In the rocking stopper 60, the stopper frame 61 is supported rockable along the conveyance direction A and the direction which intersects perpendicularly by the conveyor frame which is not illustrated, respectively. The stopper roller 62 of plurality (this example six pieces) is supported free [rotation] centering on a revolving shaft 63 by the stopper frame 61. The variation rate of the rocking stopper 60 is carried out to the evacuation location F which does not engage with the rocking location E which the stopper frame 61 is rocked and engages the stopper roller 62 with the goods 10 on the conveyance roller 30 with actuators (not shown), such as an air cylinder, respectively. That is, with an actuator, the variation rate of the stopper roller 62 is carried out to the rocking location E from the evacuation location F, and the rocking stopper 60 transfers goods 10 on the predetermined branching chute 11, only when it is what is transferred on the branching chute 11 with which the conveyed goods 10 correspond, respectively.

[0024] An operation of this example is explained. The goods 10 laid in the conveyance roller 30 are conveyed in the conveyance direction A with migration of the endless chain 20. If goods 10 arrive at the predetermined branch location set up every goods 10, the variation rate of the corresponding rocking stopper 60 will be carried out to the rocking location E from the evacuation location F in the stopper roller 62, and it will prevent migration of goods 10 in the conveyance direction A by making the stopper roller 62 engage with goods 10. Thereby, rotating the conveyance roller 30 in the direction of drawing 7 Nakaya mark B so that predetermined frictional force may be produced between the conveyance rollers 30 and the top face of the conveyance roller 30 may move to it to the migration direction and hard flow of the endless chain 20 with migration of the endless chain 20, it is converted into a plane view *** right angle, and goods 10 move a course to the method of drawing 7 Nakamigi. That is, the goods 10 which had the course converted rotating the stopper roller 62 in the direction of the counter clockwise in drawing 7, they move to the method of drawing 7 Nakamigi along with the stopper frame 61, and are transferred on the predetermined branching chute 11.

[0025] Drawing 9 and drawing 10 are drawings showing the conveyance direction convertor which is the 4th example of this invention, drawing 9 is an outline top view and drawing 10 is G view Fig. of drawing 9. In these drawings, the conveyance roller 30 formed between the endless chain 20 and the endless chain 20 opens predetermined spacing in the conveyance direction A and the direction which intersects perpendicularly, and is arranged at two or more trains (this example three trains). The conveyance roller 30 of each train conveys the goods 10, such as a laid pallet, by moving in the conveyance direction A with migration of the endless chain 20 of each set, respectively. The sprocket 21 of the drawing 9 Nakagami edge of the conveyance roller 30 of each train is mutually connected through the connection shaft 70, and drives the connection shaft 70 by rotation of the motor 72 transmitted through endless belt 71 grade. Thereby, with rotation of a motor 72, through the connection shaft 70, the sprocket 21 of the conveyance roller 30 of each train interlocks, and is rotated. Moreover, predetermined spacing is opened in the conveyance direction A in a conveyor frame, respectively, two or more (this example two pieces) arrangement is carried out, the branching chute 11 is replaced with the fixed stopper 40 in the branch location to each branching chute 11, respectively, and the rise-and-fall stopper 73 is formed corresponding to each branching chute 11. Other configurations are the same as that of the 1st example.

[0026] In the rise-and-fall stopper 73, the ctenidium-like stopper frame 74 is supported possible [rise and fall] seen from the conveyance direction A by the conveyor frame which is not illustrated, respectively. The stopper roller 75 of plurality (this example ten pieces) is supported free [rotation] centering on an almost perpendicular revolving shaft (not shown) by the stopper frame 74. With the actuators 76, such as an air cylinder prepared in the conveyance direction A both sides in a conveyor frame, the rise-and-fall stopper 73 goes up and down the stopper frame 74, and a variation rate is carried out between the rise location H which projects the stopper roller 75 more nearly up than the top face of the conveyance roller 30, and the downward location I not projecting, respectively. That is, with an actuator 76, the variation rate of the stopper roller 75 is carried out to the rise location H from the downward location I, and the rise-and-fall stopper 73 transfers goods 10 on the predetermined branching chute 11, only when it is what is transferred on the branching chute 11 with which the conveyed goods

10 correspond, respectively.

[0027] An operation of this example is explained. The goods 10 laid in the conveyance roller 30 are conveyed in the conveyance direction A with migration of the endless chain 20. If goods 10 arrive at the predetermined branch location set up every goods 10, the variation rate of the corresponding rise-and-fall stopper 73 will be carried out to the rise location H from the downward location I, and migration of goods 10 in the conveyance direction A will be prevented by making the stopper roller 75 engage with goods 10. Thereby, rotating the conveyance roller 30 in the direction of drawing 9 Nakaya mark B so that predetermined frictional force may be produced between the conveyance rollers 30 and the top face of the conveyance roller 30 may move to it to the migration direction and hard flow of the endless chain 20 with migration of the endless chain 20, it is converted into a plane view *** right angle, and goods 10 move a course to the method of drawing 9 Nakamigi. That is, the goods 10 which had the course converted rotating the stopper roller 75 in the direction of the counter clockwise in drawing 9 , they move to the method of drawing 9 Nakamigi along with the stopper frame 74, and are transferred on the predetermined branching chute 11.

[0028] Drawing 11 and drawing 12 are drawings showing the conveyance direction convertor which is the 5th example of this invention, drawing 11 is an outline top view and drawing 12 is J view Fig. of drawing 11 . In these drawings, it replaces with the rocking stopper 60 in the branch location to each branching chute 11, respectively, and the friction roller 80 is formed corresponding to each branching chute 11. Other configurations are the same as that of the 3rd example.

[0029] The friction roller 80 is supported free [rotation], respectively so that there may be a revolving shaft 82 along the drawing 11 Nakamigi edge of the roller frame 81 in the conveyance direction A. Respectively, the roller frame 81 is arranged in the left end section upper part of the conveyance roller 30 in each branch location, and is rockable considering the frame support shaft 83 as a core. the alienation which does not engage with the engagement location K (location shown with a two-dot chain line among drawing 12) where the friction roller 80 engages with the conveyance roller 30 of a predetermined number (this example four pieces) from the upper part by rocking the roller frame 81 by the actuators 84, such as an air cylinder, respectively -- a variation rate is carried out to a location L (location shown as a continuous line among drawing 12). namely, the case where the friction roller 80 is what is transferred on the branching chute 11 with which the conveyed goods 10 correspond, respectively -- an actuator 84 -- alienation -- a variation rate is carried out to the engagement location K from a location L, and it engages with the conveyance roller 30 of a predetermined number from the upper part. Thereby, with migration of the endless chain 20, the friction roller 80 rotates each conveyance roller 30 in the direction of drawing 11 Nakaya mark B, and transfers goods 10 on the predetermined branching chute 11 so that the top face of the conveyance roller 30 may move to the conveyance direction A and hard flow.

[0030] in addition, rocking of the roller frame 81 replace with the friction roller 80, fix a plate-like friction plate (not shown) to the drawing 11 Nakamigi edge of the roller frame 81, and according to an actuator 84 -- following -- a friction plate -- the engagement location K or alienation -- a location L may be made to carry out a variation rate, and you may constitute so that each conveyance roller 30 may be made to engage or estrange.

[0031] An operation of this example is explained. The goods 10 laid in the conveyance roller 30 are conveyed in the conveyance direction A with migration of the endless chain 20. the friction roller 80 which corresponds if goods 10 arrive at the predetermined branch location set up every goods 10 -- alienation -- a variation rate is carried out to the engagement location K from a location L, and it engages with each conveyance roller 30 from the upper part. With migration of the endless chain 20, the conveyance roller 30 which engaged with the friction roller 80 rotates in the direction of drawing 11 Nakaya mark B so that a top face may move to the conveyance direction A and hard flow. Thereby, goods 10 are transferred on the predetermined branching chute 11 from the conveyance roller 30.

[0032] Drawing 13 - drawing 15 are drawings showing the conveyance direction convertor which is the 6th example of this invention, and drawing 13 is [the left side view of drawing 13 and drawing 15 of an outline top view and drawing 14] M view Figs. of drawing 13 . At this example, except that it replaces

with the fixed stopper 40 and the stopper plate 90 is formed, it is the same as that of the 1st example. In side view, predetermined carries out an include-angle (this example about 45 degrees) inclination, and the stopper plate 90 is formed, engages with the conveyance direction A front upper limit section of the goods 10 on the conveyance roller 30 from the slanting upper part, and prevents migration of goods 10 in the conveyance direction A so that the upper limit section may be moved to a conveyance direction A and hard flow position.

[0033] An operation of this example is explained. The goods 10 laid in the conveyance roller 30 are conveyed in the conveyance direction A with migration of the endless chain 20. And if the stopper plate 90 engages with the conveyance direction A front upper limit section from the slanting upper part and goods 10 have migration in the conveyance direction A prevented, they will produce predetermined frictional force between the conveyance rollers 30. Thereby, rotating the conveyance roller 30 in the direction of drawing 13 Nakaya mark B with migration of the endless chain 20, so that the top face of the conveyance roller 30 may move to the conveyance direction A and hard flow, it is converted into a plane view **** right angle, and goods 10 move a course to the method of drawing 13 Nakamigi. That is, the goods 10 which had the course converted sliding on the conveyance direction A front upper limit section with the stopper plate 90, they move to the method of drawing 13 Nakamigi along with the stopper plate 90, and are transferred on the predetermined branching chute 11.

[0034] When especially the configuration of goods 10 is cylindrical, without producing stagnation by the rotation on the conveyance roller 30, it is made to rotate, a cylindrical object sliding with the stopper plate 90, moves along with the stopper plate 90, and is transferred on the predetermined branching chute 11. When passing speed of the endless chain 20 at this time is set to V, the rotational speed to the direction of drawing 13 Nakaya mark B of the conveyance roller 30 is expressed with $V/\cos\theta$, and the rate which makes a cylindrical object go to the method of drawing 13 Nakamigi is expressed with $\sin(V/\cos\theta)\theta = V \cdot \tan\theta$. Therefore, the rate which the core of a cylindrical object actually moves to the method of drawing 15 Nakamigi is set to $V/2$, and $\tan\theta$.

[0035] As mentioned above, according to the 1st - the 6th example, it is comparatively simple structure, and the sense of the goods 10 to the conveyance direction A can be changed before and after a conveyance turn, being able to convert the conveyance direction A of goods 10 without needing complicated control etc. Namely, the goods 10 conveyed to a branch location in the condition that a longitudinal direction meets in the conveyance direction A, for example change the sense to the conveyance direction A, after having the conveyance direction A converted, and the direction of a short hand will be in the condition of meeting in the conveyance direction A. Thereby, the goods 10 after a conveyance turn will stand in a row in the direction of a short hand on the branching chute 11, therefore can secure high space efficiency.

[0036] According to the 3rd, 4th, and 5th examples, moreover, the rocking stopper 60 (the 3rd example), The rise-and-fall stopper 73 (the 4th example) or the friction roller 80 (the 5th example) It prepares every branching chute 11 by which opened predetermined spacing in the conveyance direction A in a conveyor frame, and two or more arrangement was carried out. Since each stoppers 60 and 73 or the friction roller 80 is operated and goods 10 are transferred on the predetermined branching chute 11 only when it is what is transferred to the branching chute 11 with which the conveyed goods 10 correspond While the conveyance direction of goods 10 can be converted, classification ***** can do goods 10. Furthermore, without producing stagnation according a cylindrical object to the rotation on the conveyance roller 30, since it is made to rotate, engaging with the conveyance direction front upper limit section of a cylindrical object from the slanting upper part, and sliding a cylindrical object, according to the 6th example, the stopper plate 90 can make it able to move smoothly along with the stopper plate 90, and, thereby, can transfer quickly and certainly on the predetermined branching chute 11.

[0037] In addition, in the 3rd - the 6th example, although it constituted so that the conveyance roller 30 might be formed and goods 10 might be laid between the endless chains 20 like the 1st example, like the 2nd example, it may replace with the conveyance roller 30 and you may constitute from a support shaft 50 and a conveyance wheel 51. Moreover, although each above-mentioned example is a configuration which branches in the conveyance direction and the direction of a right angle, in this invention, the

branching direction may be a configuration which branches in the direction of the conveyance direction, the not only the direction of a right angle but conveyance direction, an acute angle, or an obtuse angle.
[0038]

[Effect of the Invention] As mentioned above, according to this invention, a stopper engages with the goods laid in body of revolution, prevents migration of goods in the migration direction of an endless chain, and the prevented goods Since it moves in the predetermined direction along with a stopper, rotating body of revolution so that the top face of body of revolution may move to the migration direction and hard flow of an endless chain with migration of an endless chain It is comparatively simple structure, and the sense of the goods to the conveyance direction can be changed before and after a conveyance turn, being able to convert the conveyance direction of goods without needing complicated control etc. Thereby, high space efficiency is securable. Moreover, since according to this invention a conveyance roller is rotated with migration of an endless chain so that the top face of a conveyance roller may move to the migration direction and hard flow of an endless chain when a friction member engages with a conveyance roller from the upper part The passing speed of an endless chain and the revolving shaft of a conveyance roller mainly move goods in the predetermined direction at the rate of predetermined according to the include angle made to the migration direction of an endless chain, and the direction which intersects perpendicularly. Therefore, it is comparatively simple structure, and the sense of the goods to the conveyance direction can be changed before and after a conveyance turn, being able to convert the conveyance direction of goods without needing complicated control etc. Thereby, high space efficiency is securable.

[Translation done.]